NAME: DATE:

Unit-2 Mastery Assessment (version 634)

Question 1 (10 points)

Let f represent a function. If $f[35] = 4$, then there exists a knowable solution to the equation below.

$$y = 3 \cdot (f[5x - 45] + 8)$$

Find the solution.

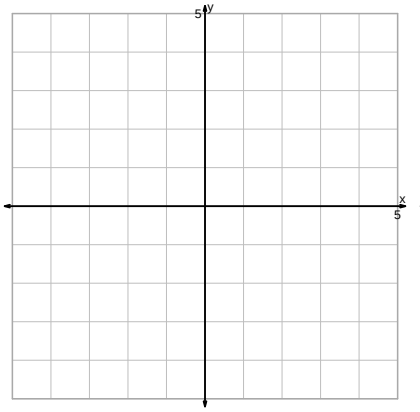
$x =$

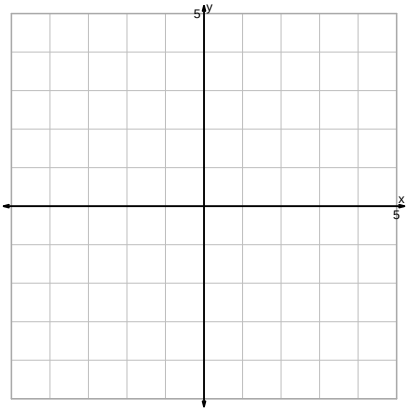
$y =$

Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.

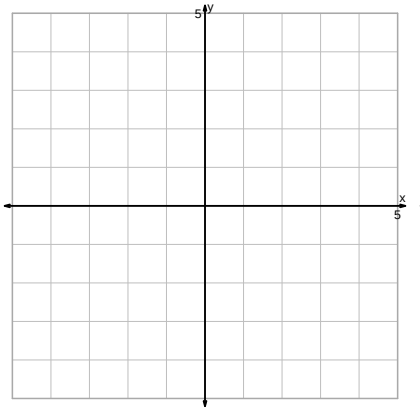
$y = \dfrac{\log_2(x)}{2}$

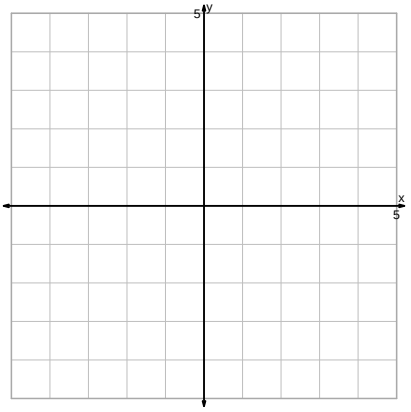




$y = 2 \cdot 2^x$

$y = -\log_2(x)$

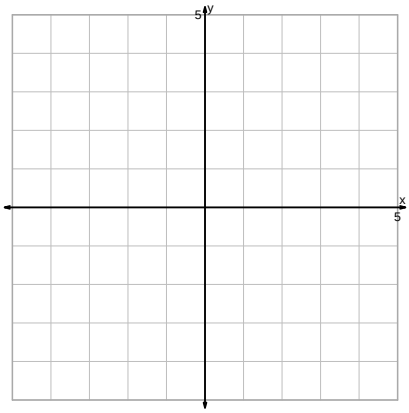


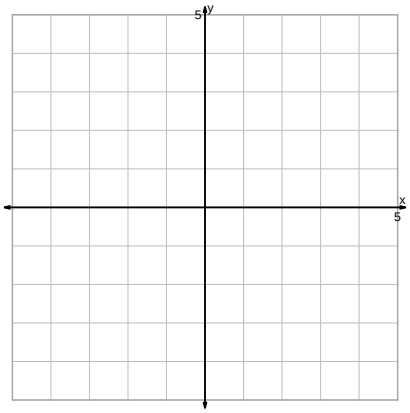


$y = x^3 + 2$

Question 2 continued...

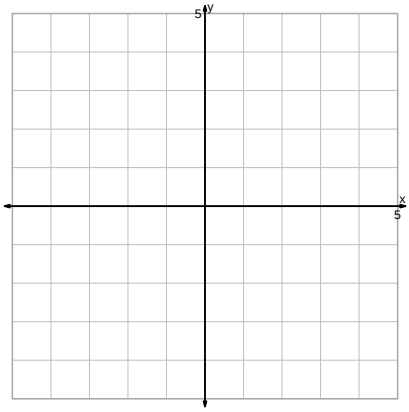
$y = \left(x - 2\right)^2$

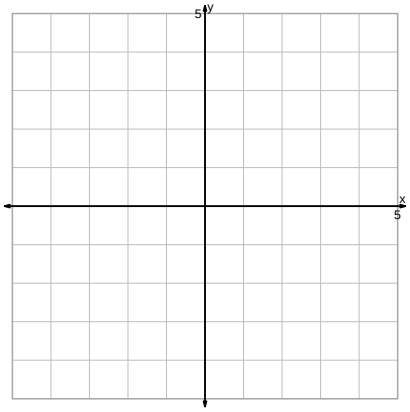




$y = \sqrt{x + 2}$

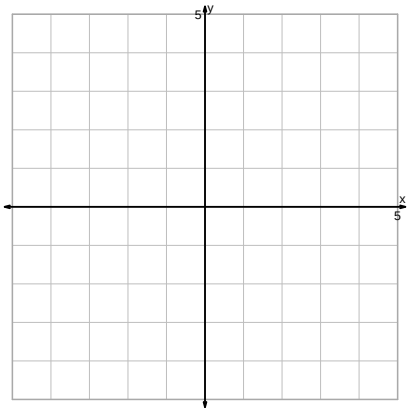
$y = \sqrt[3]{x} - 2$

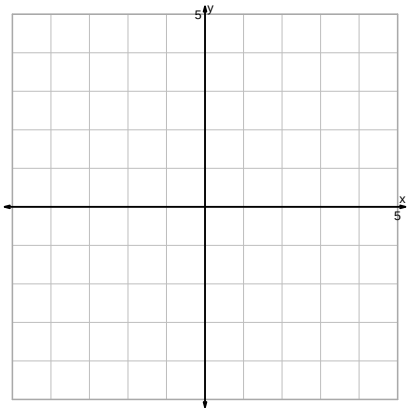




$y = \sqrt{-x}$

$y = \left(\frac{x}{2}\right)^2$

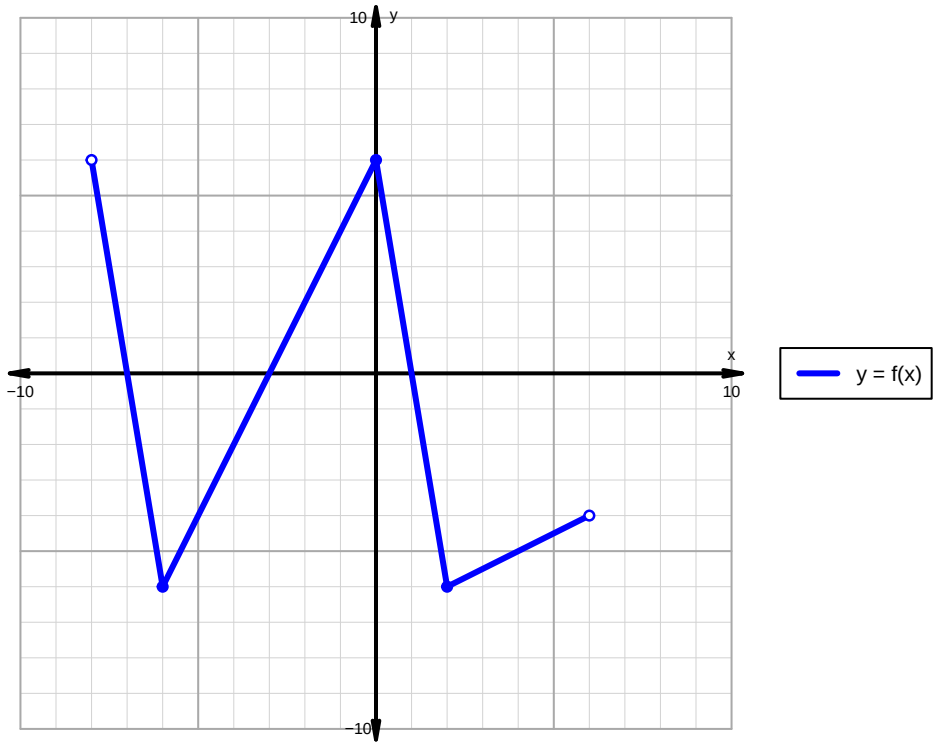




$y = \left(2x\right)^3$

Question 3 (20 points)

A function is graphed below.



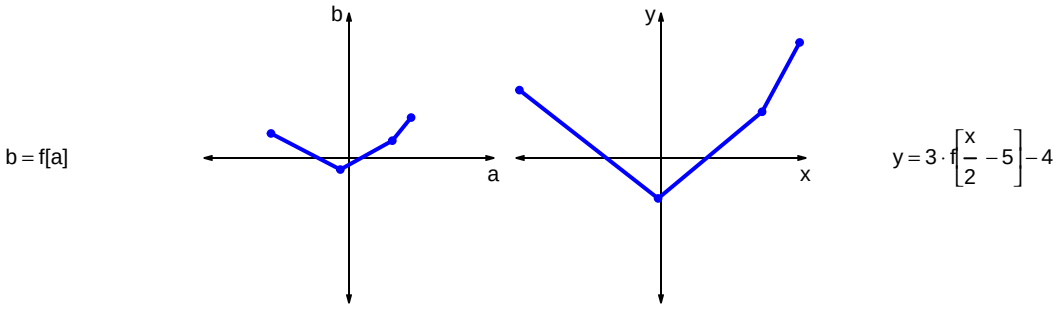
Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = 3 \cdot f\left[\frac{x}{2} - 5\right] - 4$ are represented below in a table and on graphs.

a	b	x	y
-54	17	-98	47
-6	-8	-2	-28
30	12	70	32
43	28	96	80



a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 3 \cdot f\left[\frac{x}{2} - 5\right] - 4$?

Question 5 (10 points)

A parent square-root function is transformed in the following ways:

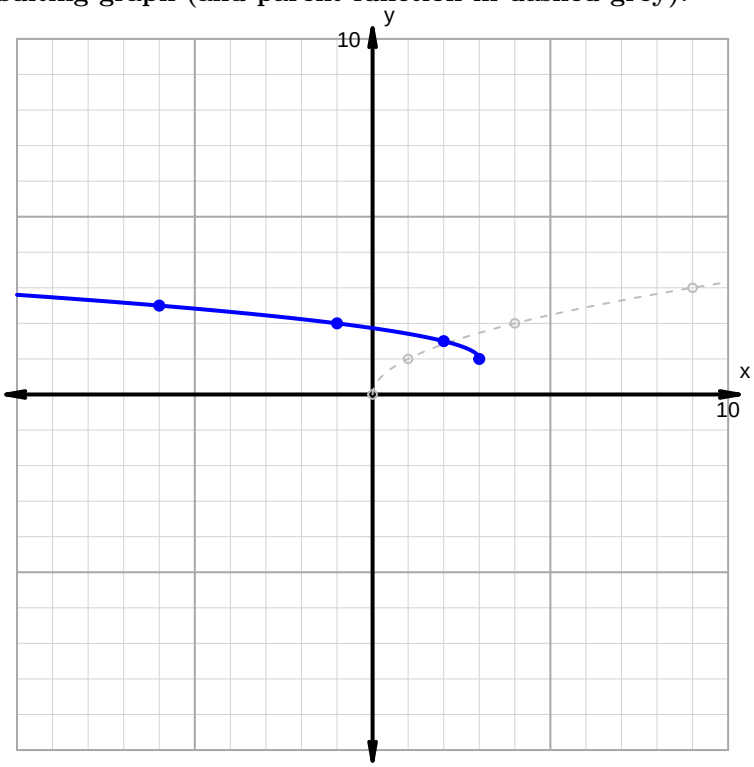
Horizontal transformations

1. Horizontal reflection over y axis.
2. Translate right by distance 3.

Vertical transformations

1. Vertical shrink by factor 2.
2. Translate up by distance 1.

Resulting graph (and parent function in dashed grey):

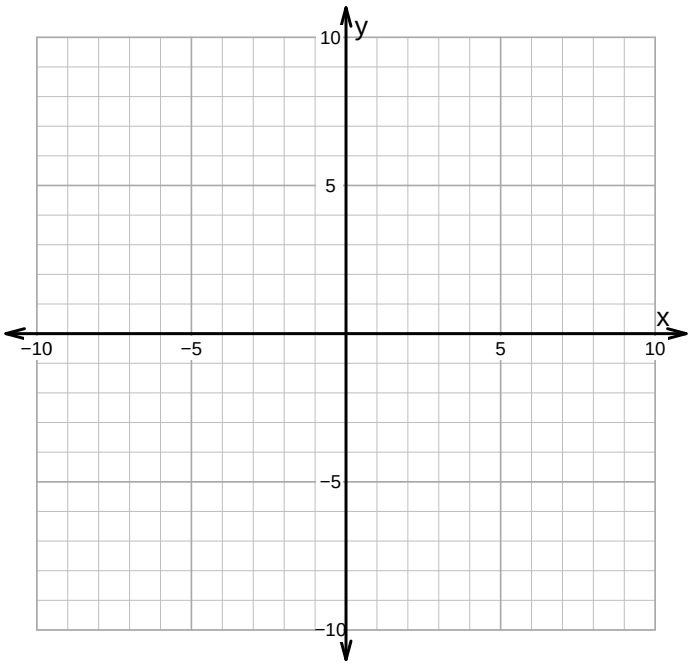


- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{-1}{3} \cdot |x - 3| + 1$$



Feature	Where
Domain	
Range	
Positive	
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Decreasing	